

where the wind had shifted to a NNW. gale, with very high seas, and to the north of Newfoundland, separated by a ridge of higher pressure over mid-ocean; southerly to westerly gales attending the latter depression prevailed south and eastward to 38° N. and 49° W. On the night of the 20th a very severe "norther," accompanied by heavy rains, commenced at Aspinwall, C. A., which, according to reports, continued with great violence to the 24th, doing an immense amount of damage to shipping, wharves and railroad stock. 22nd, rising pressure over the Atlantic between 40° and 50° N., with easterly to southerly winds from the European coast to 40° W., and brisk to high westerly winds, gales and high seas thence westward to the American coast: at Funchal the wind returned to the south. A subsidiary area of low pressure No. XIII moved from near Cape Lizard, England, northeastward. 23rd, pressure probably about normal over the east Atlantic, with gentle or moderate winds: a large area of low pressure existed, however, to the southwest of Funchal, where high SSE. winds and rough seas continued; in 22° 35' N. 18° 40' W., bark "*Janet*" was abandoned during a gale from SW. to SSW. The record of this vessel in reference to the meteorological conditions over this part of the Atlantic is interesting: on the 7th, in 30° 30' N. 24° 40' W., the captain reports "a very heavy gale from the SE., which hauled to NW., (see area No. IV.) vessel was hove down, lost portions of rigging, &c., and had decks swept; after gale, tried to make Canary Islands, but the wind coming out ahead, had to keep vessel south; went along at about 200 miles a day and hoped to get the NE. trades but there were none;" vessel abandoned on 23rd as above. An extensive area of high pressure, (30.40 or 772.2 at St. Johns, Newfoundland,) covered the western Atlantic, and light to moderate winds prevailed from Valentia to the American Coast. 24th, large area of depression to the westward of Funchal, where fresh southerly winds and rough sea prevailed, while in 34° 27' N., 28° 51' W., a NE. gale and heavy sea were reported, during which, Bark "*Olive*" was abandoned, the crew being taken on board U. S. S. *Constellation*. The large area of high barometer moved eastward and rapidly extended its influence to Great Britain and Norway, with northerly to easterly winds, thence over the Atlantic to 45° W. An area of low pressure, (No. XIII, chart I, Nov. Rev.,) moved northeastward over Newfoundland with stormy weather, followed by a high-pressure area off the coast of the United States. 25th, large area of high pressure over northern Europe, (Stornoway, 30.50 or 774.7, and Stockholm, 30.66 or 778.7;) large area of low pressure between the Azores and Canary Islands, (Funchal, 29.57 or 751.0, SSE. winds and very high sea;) rising and moderately high pressures with light winds over the west Atlantic. 26th, high but falling pressure over northern Europe and northern part of the Atlantic, (Mullaghmore, 30.41 or 772.4;) with easterly winds from Valentia to 45° W.; large area of low pressure near the Maderia Islands, (Funchal, 29.34 or 745.1, S. gale and high sea;) secondary depression. No. XVI, formed over the western Mediterranean; low area, No. XV, to the north of Newfoundland, moving eastward; higher pressures and northwesterly winds thence south and westward. 27th, large depression, central over the Atlantic north of Funchal, extending eastward over Spain and the western Mediterranean; high area to the northwest of Ireland, gradually diminishing in extent and pressure, with easterly winds from Valentia to 35° W.; low area No. XV probably moved southeastward, but with little energy, as shown on chart; rising pressure over Newfoundland and southward, with northwesterly winds extending eastward to 50° W. 28th, area of low pressure passed eastward over Spain, while the small area of high barometer to the west of Ireland diminished in extent and pressure. At Funchal the wind changed to N. high, with rising pressure and moderating sea; easterly winds prevailed from the Irish and French coasts to 35° W., which increased to a fresh gale in 47° N., 15° W.; low area No. XV was probably central near 45° N., 40° W., but without much energy; high pressure and light winds over the western Atlantic. 29th and 30th, area of lowest pressure over the Mediterranean; high pressures north of 50° N., from 15° to 45° W., with easterly winds near that parallel; low area No. XV probably central about 40° N., 40° W., but with little energy; low area No. XVI, chart I, November REVIEW, moved eastward north of Newfoundland on the 30th, followed by high pressures on the American coast.

TEMPERATURE OF THE AIR.

The general distribution of temperature for the month is shown by the isothermal lines and figures upon chart No. II. Upon the right side of the same chart, will be found a table, giving the average temperature by districts, for December, for several years and of this year. From New England, the Lower Lake region, and Ohio valley, southwestward to the Gulf and southeastern Rocky Mountain Slope, and for Boise City, Idaho, the average is higher than usual, the greatest difference being for the South Atlantic States. At Salt Lake City it has been normal. In all the other districts it has averaged lower than usual, especially in the Missouri and Red River of the North valleys.

Minimum Temperatures.—*Maine*: —26° at *Orono and —15° at Eastport. *New Hampshire*: —26° on Mt. Washington and —14° at *Grafton. *Vermont*: —28° at Newport and —19° at Burlington. *Massachusetts*: —6° at *Amherst and 0° at Boston, and Springfield. *Rhode Island*: 7° at Newport. *Connecticut*: 2° at *Mystic and 4° at New Haven. *New York*: —24° at *Madison Barracks and *Schroon Lake, —20 at *Plattsburg Barracks, —7° at Oswego, 1.05 at Buffalo and 11 at New York City. *Pennsylvania*: —7° at *Dyberry, 3° at *Catawissa, 5° at Pittsburg and 11° at Philadelphia. *Delaware*: 18° at *Dover. *Maryland*: 6° at *Emmitsburg and 13° at Baltimore. *District of Columbia*: 13° at Washington. *Virginia*: 10° at *Wytheville and 25 at Norfolk. *West Virginia*: 7° at *Helvetia and 18° at Morgantown. *North Carolina*: 8° at *Highlands, 24° at Wilmington and 33° at Cape Hatteras. *South Carolina*: 26° at *Aiken and 34° at Charleston. *Georgia*: 17° at Atlanta and 33° at Savannah. *Florida*: 28° at Pensacola, 36° at

Cedar Keys and Jacksonville, and 68° at Key West. *Alabama*: 16° at *Green Springs and 24° at Mobile. *Mississippi*: 18° at *Fayette and 19° at Vicksburg. *Louisiana*: 18° at Shreveport and 32° at New Orleans. *Texas*: —10° at Fort Elliott, 2° at Pilot Point and Graham, 9° at Denison and Mason, 10° at Stockton and Uvalde, 27° at Brownsville and Rio Grande, and 24° at Galveston. *Ohio*: —15° at *Wooster, —1° at Cleveland, 5° at Columbus and 11° at Cincinnati. *Kentucky*: 12° at Louisville. *Tennessee*: 11° at *McMinnville and Knoxville. *Arkansas*: 10° at *Mt. Ida and 16° at Little Rock. *Michigan*: —14° at Escanaba, —9° at Marquette, —5° at Alpena, —2° at Detroit and Port Huron, —3° at *Lansing and 6° at Grand Haven. *Indiana*: 2° at *Wabash, 5° at Indianapolis and 9° at *New Harmony. *Illinois*: —16° at *Riley and *Belvidere, —2° at Chicago and 12° at Cairo. *Missouri*: —17° at *Oregon, —11° at *Kansas City and —1° at St. Louis. *Kansas*: —16° at *Fort Wallace, —13° at Dodge City and —8° at Leavenworth. *Wisconsin*: —32° at *Neillsville, —26° at La Crosse, and —12° at Madison and Milwaukee. *Iowa*: —35° at *Cresco, —27° at *Vail, —19° at Dubuque and —16° at Des Moines. *Nebraska*: —37° at *Fort Sydney, —27° at North Platte and *Genoa, and —17° at Omaha. *Indian Territory*: 2° at Fort Sill and 4° at Fort Gibson. *Minnesota*: —40° at Breckenridge, —39° at St. Paul and —34° at Duluth. *Dakota*: —59° at Pembina, —46° at Fort Buford and Fort Keogh, —38° at Bismarck, —34° at *Olivet and —16° at Deadwood. *Colorado*: —31° on summit of Pike's Peak, —19° at *Fort Garland and —17° at Denver. *New Mexico*: —22° at *Ft. Union, —13° at Santa Fé and 16° at La Mesilla. *Wyoming*: —34° at *Ft. Fred Steele and —24° at Cheyenne. *Utah*: —22° at *Coalville and —10° at Salt Lake City. *Nevada*: —20 at Winnemucca, —13° at Pioche and —11° at *Carson City. *Arizona*: —18° at Prescott, —2° at Apache, 0° at Phoenix and 27° at Yuma. *Idaho*: —30° at *Ft. Hall, and —4° at Boise City. *Montana*: —36° at Virginia City. *California*: 15° at San Geronimo, 25° at Red Bluff, Sacramento and Princeton, 32° at San Diego and 34° at San Francisco. *Oregon*: —14° at Umatilla, 3° at Portland and 7° at Roseburg. *Washington Ty.*: —17° at Dayton and 10° at Olympia. In northern New York and New England, the minimum temperatures occurred on the 21st and 22nd, accompanying high pressure No. VIII. In all the other sections they accompanied high pressure No. IX, and prevailed as follows: From the North Pacific coast to Dakota, on the 23rd and 24th; from the Middle and South Pacific coasts to Minnesota, Iowa, Kansas, Indian, Ty. and New Mexico, on the 24th and 25th; from Texas to the Upper Lakes, Lake Erie, Ohio valley and Tennessee, on the 25th and 26th; from the Gulf States to the Middle States, except in northern New York, on the 26th and 27th.

Maximum Temperatures.—*Maine*: 55° at *Surry and Portland. *New Hampshire*: 52° at *Grafton and 40° on Mount Washington. *Vermont*: 53° at *Charlotte and 54° at Burlington. *Massachusetts*: 63° at Boston and *Newburyport and 55° at Springfield. *Rhode Island*: 58° at Newport. *Connecticut*: 60° at *Mystic and New London. *New York*: 64° at *Brookhaven, 44° at *Plattsburg Barracks, 58° at Buffalo and 62° at New York City. *Pennsylvania*: 63° at *Fallington, and 61° at Philadelphia, *Chambersburg and Pittsburgh. *Delaware*: 62° at *Dover. *Maryland*: 63° at Baltimore, *Fallston and *Emmitsburg. *District of Columbia*: 64° at Washington. *Virginia*: 79° at *Johnsontown, 74° at Cape Henry and *Accotink, and 55° at *Walnut Grove. *West Virginia*: 66° at Morgantown and 65° at *Helvetia. *North Carolina*: 78° at Wilmington, 68° at Cape Lookout and 59° at *Highlands. *South Carolina*: 75° at *Aiken and Charleston. *Georgia*: 80° at *Forsyth, and 76° at Savannah and Augusta. *Florida*: 86° at *Houston, 83° at Key West, 79° at Jacksonville and 75° at Pensacola. *Alabama*: 76° at Montgomery and 74° at Mobile. *Mississippi*: 78° at Vicksburg and *Brookhaven. *Louisiana*: 83° at *Lake Charles and 78° at New Orleans. *Texas*: 83° at Eagle Pass, 80° at Brownsville, 79° at Indianola and 76° at Denison. *Ohio*: 68° at *Ringgold, 63° at Cincinnati, and 62° at Columbus and Cleveland. *Kentucky*: 67° at Louisville. *Tennessee*: 72° at Chattanooga, and 68° at *McMinnville and *Ashwood. *Arkansas*: 73° at Little Rock and 70° at *Mount Ida. *Michigan*: 59° at *Niles and Detroit, 58° at Grand Haven, *Battle Creek and *Lansing, and 44° at Marquette. *Indiana*: 67° at *Vevay and 64° at Indianapolis and *New Harmony. *Illinois*: 66° at Cairo, 65° at *Anna, and 62° at Chicago and *Peoria. *Missouri*: 67° at *Craig, 65° at *Kansas City, *Oregon and *Pierce City, and 63° at St. Louis. *Kansas*: 78° at *Creswell, 70° at Dodge City and 63° at Leavenworth. *Wisconsin*: 57° at *Beloit and Milwaukee, and 44° at La Crosse. *Iowa*: 58° at *Glenwood and Keokuk, and 52° at Des Moines. *Nebraska*: 70° at *Fort Sydney, 57° at North Platte and 54° at Omaha. *Indian Territory*: 75° at Fort Sill and 69° at Fort Gibson. *Minnesota*: 40° at St. Paul, 38° at Duluth and 35° at Breckenridge. *Dakota*: 50° at Deadwood, 47° at *Olivet and *Morriston, 42° at Fort Keogh, 36° at Bismarck and 28° at Pembina. *Colorado*: 66° at Denver and *Fort Lyon, 49° at *Fort Garland, and 23° on summit of Pike's Peak. *New Mexico*: 73° at La Mesilla, 71° at *Ft. Union and 53° at Santa Fé. *Wyoming*: 57° at Cheyenne and 47° at *Fort Fred Steele. *Utah*: 52° at Salt Lake City and 48° at *Coalville. *Nevada*: 66° at *Carson City, and 55° at Pioche and Winnemucca. *Arizona*: 74° at Yuma, Florence and Tucson, and 61° at Prescott. *Idaho*: 59° at Boise City and 48° at *Fort Hall. *Montana*: 44° at Virginia City. *California*: 76° at Los Angeles, 71° at San Diego, 64° at San Francisco and 63° at Sacramento. *Oregon*: 56° at Roseburg.

Those stations marked with a star (*) have been reported by Voluntary Observers, or U. S. Army Post Surgeons.

Ranges of Temperature at Signal Service stations.—The monthly ranges will appear from an examination of the Maxima and Minima just given. The greatest daily ranges vary in New England from 27° at Thatcher's Island to 47° at Eastport; Middle Atlantic States, 24° at New York, Cape May and Baltimore to 38° at Albany; South Atlantic States, 25° at Kittyhawk and 28° at Jacksonville to 37° at Atlanta; Eastern Gulf States, 12° at Key West and 26° at Cedar Keys to 34° at Pensacola, Mobile and New Orleans;

Western Gulf States, 29° at Little Rock and 35 at Vicksburg to 46° at Indianola; Ohio valley and Tennessee, 25° at Louisville and 29° at Morgantown to 44° at Memphis and 50° at Chattanooga; Lower Lake region, 25° at Detroit and 26° at Erie to 37° at Oswego; Upper Lake region, 21° at Grand Haven and 28° at Alpena to 35° at Duluth; Upper Mississippi valley, 30° at Keokuk and 38° at St. Paul to 42° at Des Moines; Red River of the North valley, 36° at Breckenridge and Pembina; Missouri valley, 31° at Omaha to 40 at Bismarck and 42° at Ft. Buford; Texas, 37° at Mason to 40° at Davis, 45° at Rio Grande, Concho and Brackettsville, and 67° at Ft. Elliott; Eastern Rocky Mountain slope, 24° at Dodge City and 34° at Ft. Gibson to 51° at North Platte; Rocky Mountains, 35° at Socorro to 41° at Virginia City, 46° on Pike's Peak and 61° at Denver; Northern and Middle Plateau Districts, 22° at Boise City to 27° at Pioche and 30° at Winnemucca; California, 14° at San Francisco to 28° at Visalia, 29° at Red Bluff and 33° at Los Angeles.

Frost was reported very generally from all States and Territories north of the 35th parallel. In Florida on the 16th, 17th, 18th, 26th, 27th and 28th, in the remaining states of the East Gulf, 1st, 6th, 7th, 12th, 13th, 15th to 18th, 25th to 28th. West Gulf States, 1st, 3rd, 7th, 11th to 19th, 21st, 24th to 27th; at Lake Charles, La., 25th, "intensely cold, all tender vegetation killed, a thing never known in this section before." Indian Territory, 1st, 3rd, 5th, 6th, 7th to 20th, 24th, to 31st. Arizona, 10th, 16th, 18th, 23rd to 31st, very heavy. California, 2nd, 3rd, 4th, 6th, 7th, 8th to 12th, 14th to 18th, 21st to 31st; at Los Angeles, on the 25th, plants and vegetables in many localities entirely destroyed.

Ice formed generally throughout the northern sections of the country, as will be seen by reference to the chapter on Navigation. In the Eastern Gulf States it formed on the 24th, 25th, 26th and 27th; Western Gulf States, 12th, 13th, 25th, 26th and 27th; Texas and Indian Territory, 6th, 12th, 13th, 14th, 24th, 25th, 26th and 27th. California, at San Francisco, on the 24th; Los Angeles, 25th; Visalia, 23d and 25th; Red Bluff, 23d, 24th, (25th 2½ inches;) Sacramento, 23d, 24th and 25th; Hooker's Lake, below the city, frozen over sufficiently solid for skating—first time in twenty-five years. On the 25th the water pipes in the city frozen up. Washington, 25th, shallow water ponds frozen over.

Ground Frozen.—Lompoc, Cal., 24th, ½ inch, 31st; Lake Charles, La. 25th; Brookhaven, Miss., 26th and 7th; Melissa, Tex., 11th; Sacramento, Cal., 23rd, 24th and 25th; Red Bluff, Cal., 24th and 25th; Visalia, Cal., 23d and 25th; Prescott, Ariz., 25th; Keokuk, Ia., ground remained frozen throughout the month.

The following notes are of interest as indicating the *excessive cold* of the month, in various sections:—Logan, Ia., 19th, -20°, the coldest day, at noon, in the past twenty years; Melissa, Tex., 24th, 12:15 p. m., heavy north wind, with snow and sleet, freezing as it fell; chickens were frozen fast to limbs of trees; ice formed on tanks to the depth of three inches, and the snow formed a crust so firm and hard that a horse's hoof made no impression. Coalville, Utah, 24th, -22°, coldest day in fourteen years. Humboldt Wells, Broncho and Truckee, Cal., 26th, excessively cold, mercury frozen. Prescott, Ariz., 25th, -18°, supposed to be the lowest temperature ever known in the territory. Virginia City, Montana, 24th, 1,500 sheep frozen to death and several herders badly frozen; 23rd to 26th, ranchmen reported a storm of wind and snow of unprecedented severity, all mails stopped and several mail-coaches lost. North Platte, Dak., 11th, mail-carrier frozen to death; 24th, -32°, coldest ever known here. Bismarck, Dak., 24th, -38, lowest temperature ever recorded at this station. Breckenridge, 13th, two children and one man frozen to death. San Antonio, Tex., 25th, many cattle and sheep have died in this section from excessive cold. Boerne, Tex., 25th, 26th, most extreme cold for many years; telegraph battery frozen solid. Brackettsville, Tex., 25th, telegraph battery frozen solid. Brownsville, Tex., 25th, many sheep have perished from excessive cold. Pembina, Dak., heavy "blizzard" from the northwest, accompanied by a blinding snow-storm, blocking highways and obstructing railway communication.

PRECIPITATION.

The general distribution of the rain-fall, (which includes melted snow,) will be found upon chart No. III, as accurately as it has been possible to illustrate the same. The data has been taken from the reports from nearly five hundred stations. Upon the left side of the chart is given a table of average precipitation for December. An examination of the same will show that there has been an excess in California, the Missouri valley, Minnesota, Eastern Gulf States, Middle Atlantic States, New England, St. Lawrence valley, Lake region, Ohio valley and Tennessee; greatest in the last section, where it amounted to nearly five inches, and least in the Eastern Gulf States. In the other districts there has been a deficiency; least in the Upper Mississippi valley, and greatest in the Western Gulf States, where over two inches less than the average has fallen.

Special Heavy Rains.—5th, *White Plains, N. Y., 5th and 6th, 4.45 in.; *Ft. Barrancas, Fla., 5.43 inches in 5 hrs and 20 min.; Yreka, Cal., 3.54 in. 6th, *Fayetteville, N. C., 3.00 in. 10th, *McMinnville, Tenn., 10th and 11th, 2.50 in.; *Austin, Tenn., 9th and 10th, 2.62; *Ft. Barrancas, Fla., 1.74 inches in 3 hrs and 40 min.; Memphis, Tenn., 9th and 10th, 3.50 in.; Helena, Ark., 9th and 10th, 3.32 in.; Paducah, Ky., 9th and 10th, 3.99 in. 11th, Knoxville, Tenn., 2.46 in.; Chattanooga, Tenn., 10th and 11th, 3.10 in.; *Brookhaven, Miss., 10th and 11th, 2.30 in.; *Ft. Barrancas, Fla., 2.33. 13th, *Gainesville, Ga., 13th and 14th, 4.40 in.; *Dover Mines, Va., 13th and 14th, 3.20 in.; *Forsyth, Ga., 13th and 14th, 3.15 in.; *Lenoir, N. C., 13th and 14th, 3.30 in.; *Franklin, N. C., 13th and 14th, 3.20 in.; *Highlands, N. C., 13th and 14th, 3.85 in.; *White Plains, N. Y., 13th and 14th, 2.20 in. 14th, Montgomery, Ala., 2.66 in.; Atlanta, Ga., 3.76 in.; Charlotte, N. C., 2.38 in.; Lynchburg, Va., 2.98 in.; Sandy Hook, N. J., 2.45 in.; *Ft. Barrancas,